

# A. ANALYSIS ASSUMPTIONS AND METHODS

## *Spatial Modeling and Bioregion Review*

### A.1 SPATIAL MODELING FOR THE VEGETATION TREATMENT PROGRAM (VTP) – EXECUTIVE SUMMARY

#### A.1.1 ABSTRACT

The proposed Vegetation Treatment Program (VTP) of the California Department of Forestry and Fire Protection (Cal Fire) will operate on a base of approximately 31 million acres of wildland vegetation throughout California, with approximately 28 million acres of those acres being within treatable vegetation types. Over 90% of the base area is on private, non-federal jurisdictions lands, where land use ranges from wildland-urban interface (WUI) areas, to commercial timber production, to sparsely populated ranches or non-commercial private lands.

Not all eligible wildland acres are in equal need of, or would equally benefit from, vegetation treatment under the program. Under this PEIR three treatable vegetation types (Tree, Shrub, Grass) were identified, along with three treatments (WUI, Fuel Breaks, and Ecological Restoration).

In support of the PEIR, three separate Geographic Information System (GIS) based analyses were performed to map areas of eligible acres for VTP projects under the three treatments and within the three treatable vegetation types. The first analysis provided possible project areas that fell within the State Responsibility Area (SRA) and identified wildland urban interface (WUI) areas. The second analysis provided possible project areas that created fuel breaks along ridgelines and identified potential fuel breaks along roadways in the State Responsibility Areas and Local Responsibility Areas (LRA). The third analysis provided possible project areas within Ecological Areas, which were identified by selecting all State Responsibility, excluding any area identified as wildland urban interface (WUI), and identifying area where the condition class identified by FRAP was a two or a three. All three analyses were overlaid with the three treatable vegetation types to produce the approximate treatable acres under the VTP.

Two additional Geographic Information System (GIS) based analyses were also performed to map the alternative VTP projects. The first analysis consisted of including all wildland urban interface (WUI) areas within the SRA and joining it with Fuel Breaks exclusively within the WUI in both the State Responsibility Areas (SRA) and Local Responsibility Areas (LRA). The second analysis identified areas that were Very High

Fire Danger Severity Zones (VHFDZ) within the State Responsibility Area (SRA). These two analyses were also overlaid with the three treatable vegetation types to produce the approximate treatable acres under the VTP. The produced maps, tables, charts, and graphs depict all available treatable acreages at a statewide level within the VTP.

### **A.1.2 STATE OF CALIFORNIA RESPONSIBILITY AREAS**

The State of California is divided into three different types of responsibility areas: Federal Responsibility Areas (FRA), State Responsibility Areas (SRA), and Local Responsibility Areas (LRA). The definition of State Responsibility Area (SRA) is defined by Public Resources Code (PRC) 4126, while lands that shall not be included in the SRA are defined in PRC 4127. The methodology for determining FRA, SRA, and LRA within California is described in Cal Fire's State Responsibility Area Classification System<sup>1</sup>, which more clearly describes the process for excluding and including lands in the SRA. This EIR primarily focuses on SRA lands and only includes LRA lands when discussing Fuel Break, Alternative B, and Alternative C treatment areas. FRA lands are excluded in their entirety.

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<sup>1</sup> Available at [http://frap.fire.ca.gov/projects/sra\\_review/downloads/SRA%20Review/2013%20SRA%20Review/SRA\\_Classification\\_System\\_Update.pdf](http://frap.fire.ca.gov/projects/sra_review/downloads/SRA%20Review/2013%20SRA%20Review/SRA_Classification_System_Update.pdf)

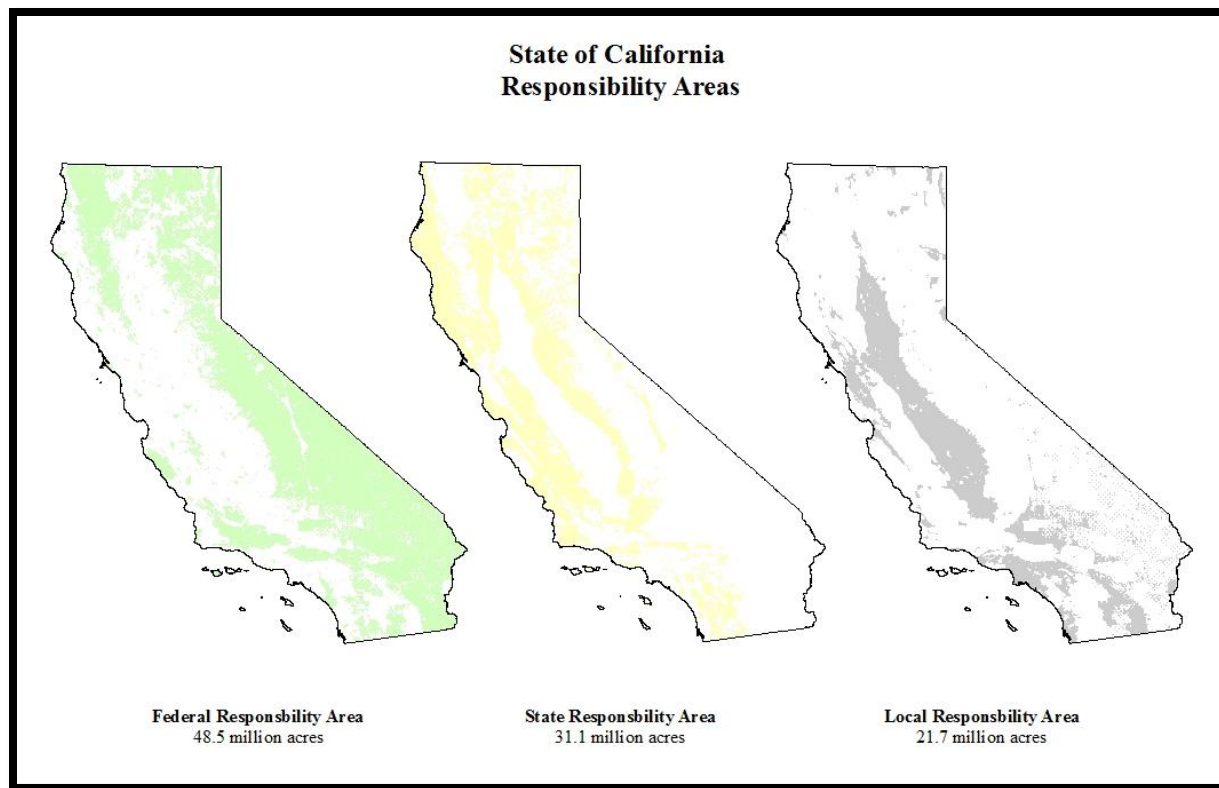


Figure A.1-1 Responsibility areas within the State of California.

### A.1.3 VEGETATION FORMATIONS

Within the State and Local Responsibility Areas the VTP identified Treatable Vegetation Formations. These are identified and grouped throughout the document by tree, shrub, and grass. These groups are assembled by their respective WHR name and extracted out of the FVEG06\_1<sup>2</sup> database to create the VTP vegetation layer (Figure A.1-2). These formations were then intersected with the Treatments and Alternative Treatments to create *Treatable Acres within the Treatments*.

<sup>2</sup> Available at [http://frap.fire.ca.gov/data/frapgisdata-sw-fveg\\_download.php](http://frap.fire.ca.gov/data/frapgisdata-sw-fveg_download.php).

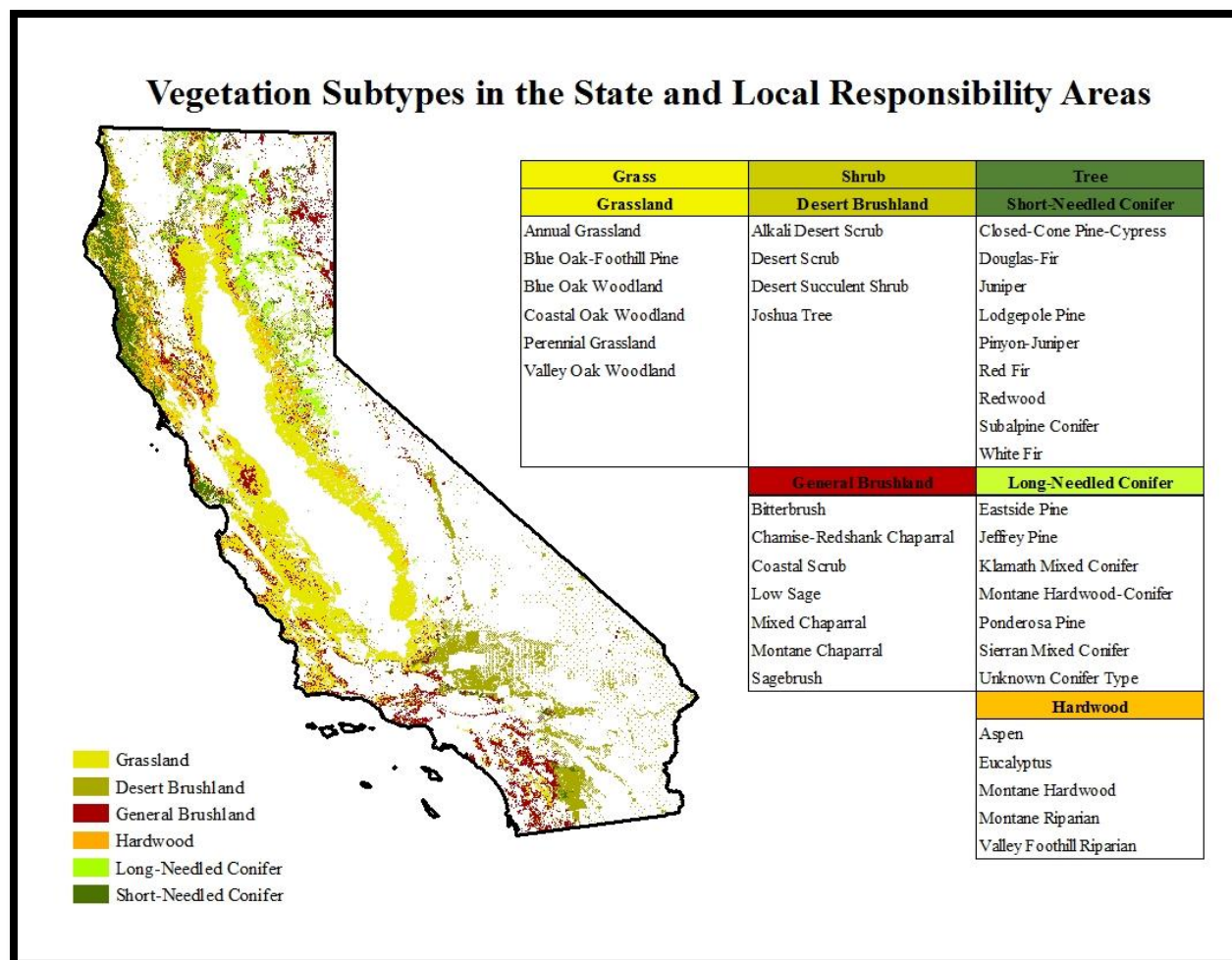


Figure A.1-2 Vegetation Subtypes in the State Responsibility Areas.

### A.1.4 TREATMENTS

Three treatments types were identified within the VTP: Wildland Urban Interface (WUI), Fuel Breaks, and Ecological Restoration. Each requiring a different level and type of analysis to derive total acreage within a treatment area, see table A.1-1.

Table A.1-1 VTP Treatment Analysis Table

VTP Treatment Areas				
	WUI	Fuel Breaks		Ecological Restoration
Base Layer	WUI Zones	Ridgelines	Roads	SRA
Overlays	SRA	SRA & LRA	SRA & LRA Condition Class 2 & 3 WUI	Condition Class 2 & 3 Non-WUI
Exclusions	Non-WUI			
Proximity		150ft Buffer	150ft Buffer	

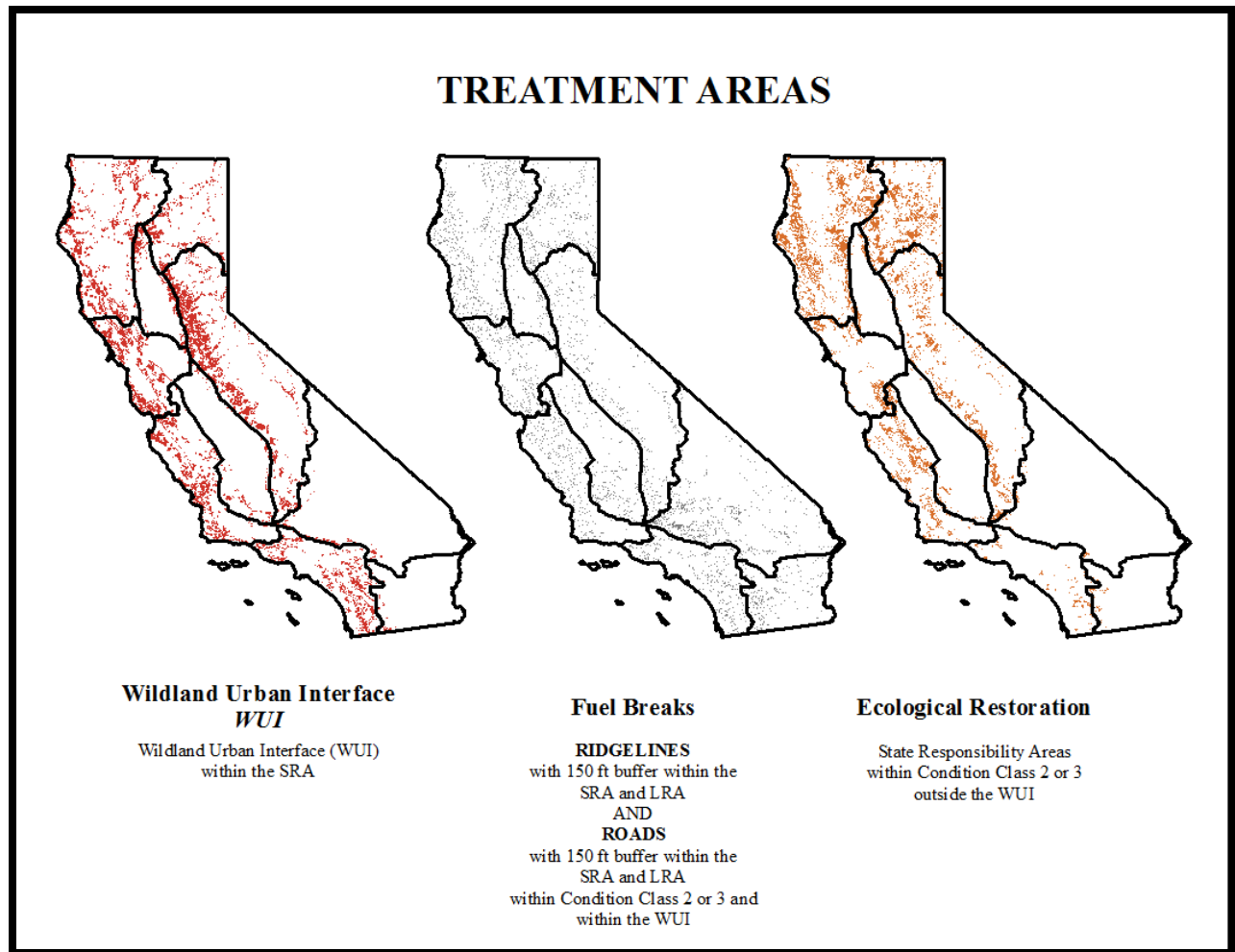


Figure A.1-3 Treatment Areas identified within the VTP.

#### A.1.4.1 Treatment: Wildland Urban Interface (WUI)

The Wildland Urban Interface (WUI) Treatment Area was derived from WUI03\_1<sup>3</sup> and SRA14\_1<sup>4</sup>. WUI was identified and extracted from WUI03\_1. State Responsibility Areas was identified and extracted from SRA14\_1. WUI and SRA were then overlaid and overlapping areas were identified to create the WUI Treatment Area for analysis within the VTP.

#### A.1.4.2 Treatment: Fuel Breaks

The Fuel Break Treatment Area was derived through analysis of ridgelines and roadways. There is no standard dataset for California which identifies ridgelines within the state; therefore a ridgeline model was created from the USGS Digital Elevation Model of California reversing the hydrological toolset within ESRI's ArcMap to acquire ridgelines instead of steams. More information about that process can be found at

<sup>3</sup> Available at <http://frap.cdf.ca.gov/data/frapgisdata-sw-wui.php>

<sup>4</sup> Available at [http://frap.cdf.ca.gov/projects/sra\\_mapping/sra\\_2014.php](http://frap.cdf.ca.gov/projects/sra_mapping/sra_2014.php)

ESRI's website.<sup>5</sup> While the ridgelines created an accurate model for a large majority of the state, we do acknowledge that the modeling had trouble with mesa areas in southern California and Modoc, therefore some areas within the southern California bioregions and the Modoc bioregions may have slightly higher available treated acres than what is truly available within the Fuel Break Treatment Areas. The identified ridgelines were given a 150ft rounded buffer and then overlaid with State Responsibility (SRA) and Local Responsibility (LRA) lands. Areas where extracted where the two layers intersected to create the ridgeline features of the Fuel Break Treatment Area. Cal Fire does not maintain a statewide roads layer; therefore the ESRI Streets layer was utilized as a standard road layer for this analysis. Roads were given the same 150ft rounded buffer that the ridgelines received, but were instead overlaid with not only with State Responsibility (SRA) and Local Responsibility (LRA) lands, but also WUI and Conditional Class 2 or 3 from CAFRCC03\_2<sup>6</sup>. Roads and Ridgelines were then merged together, to create the Fuel Break Treatment Area for analysis within the VTP.

#### **A.1.4.3 Treatment: Ecological Restoration**

The Ecological Restoration Treatment Area was derived from SRA14\_1, CAFRCC03\_2, and WUI03\_1. State Responsibility Areas, Condition Class 2 or 3, and Non-WUI were overlaid and overlapping areas were identified to create the Ecological Restoration Treatment Area for analysis within the VTP.

#### **A.1.5 ALTERNATIVES**

Four Alternatives were identified within the VTP, alternative A, B, C, D. Similar to the treatments, each required a different level and type of analysis to derive total acreage within an alternative treatment area with the exception of Alternative D which utilized the previous VTP footprint, see table A.1-2.

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<sup>5</sup> Available at <http://support.esri.com/cn/knowledgebase/techarticles/detail/39093>

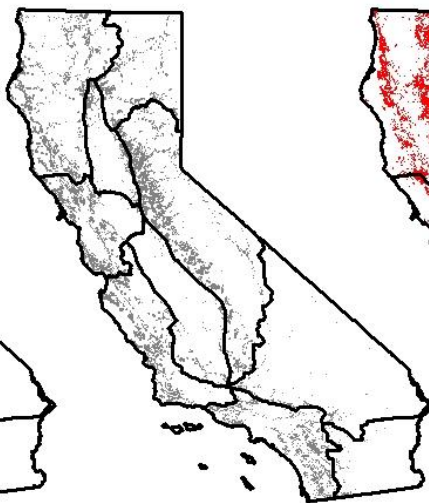
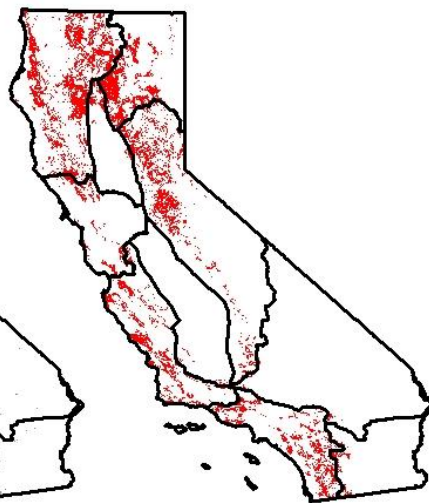
<sup>6</sup> Available at <http://frap.fire.ca.gov/data/frapgisdata-ffrcc-statewide.php>



**Table A.1-2. Alternative Analysis Table**

Alternatives				
	Alternative A	Alternative B		Alternative C
Base Layer	WUI*	WUI*	Fuel Breaks*	Fire Hazard Severity Zones (LRA & SRA)
Overlays				VHFDSZ
Exclusions				
Proximity				

\* Derived from the VTP Analysis.

**ALTERNATIVES****Alternative A**Wildland Urban Interface (WUI)  
within the SRA**Alternative B**Wildland Urban Interface (WUI)  
within the SRA  
AND  
Fuel Breaks within the WUI  
in the SRA & LRA**Alternative C**Very High Fire Hazard  
Severity Zones  
(VHFHSZ)  
within the SRA**Figure A.1-4 Alternative Treatment Areas identified within the VTP.****A.1.5.1 Alternative A: Wildland Urban Interface (WUI)**

Alternative A utilized the previously described WUI treatment area with no alterations.

#### **A.1.5.2 Alternative B: Wildland Urban Interface & Fuel Breaks**

Alternative B also utilized the previously described WUI treatment areas with no alterations. The previously described Fuel Breaks were overlaid with WUI areas in both the SRA and LRA. Overlapping areas between Fuel Breaks and WUI were identified to create an Alternative B Fuel Break. The WUI treatment areas were then combined with Alternative B Fuel Breaks to create the Alternative B Treatment Area for the alternative analysis within the VTP.

#### **A.1.5.3 Alternative C: Very High Fire Danger Severity Zones (VHFDSZ)**

Alternative C Treatment Areas were derived from FHSZS06\_3<sup>7</sup>. Areas identified within the data set as Very High Fire Danger Severity Zones (VHFDSZ) were extracted to create the Alternative C Treatment for alternative analysis within the VTP.

#### **A.1.5.4 Alternative D: Air Quality**

Alternative D Treatment Areas were placed in the same footprint as the VTP treatment area with only a reduction in acres treated applied. No additional spatial analysis was conducted.

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<sup>7</sup> [http://www.fire.ca.gov/fire\\_prevention/fire\\_prevention\\_wildland\\_zones\\_maps.php](http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_maps.php)



## A.2 BIOREGION OVERVIEW

### A.2.1 KLAMATH/ NORTH COAST BIOREGION

**Description:** Bounded on the west by the Pacific coastline and on the north by the Oregon border. The bioregion extends eastwards to include all of Klamath National Forest and Shasta-Trinity National Forest and the entire North Coast Range (down to the Sacramento Valley floor) The southern boundary reaches the southern limits of Lake and Mendocino counties.

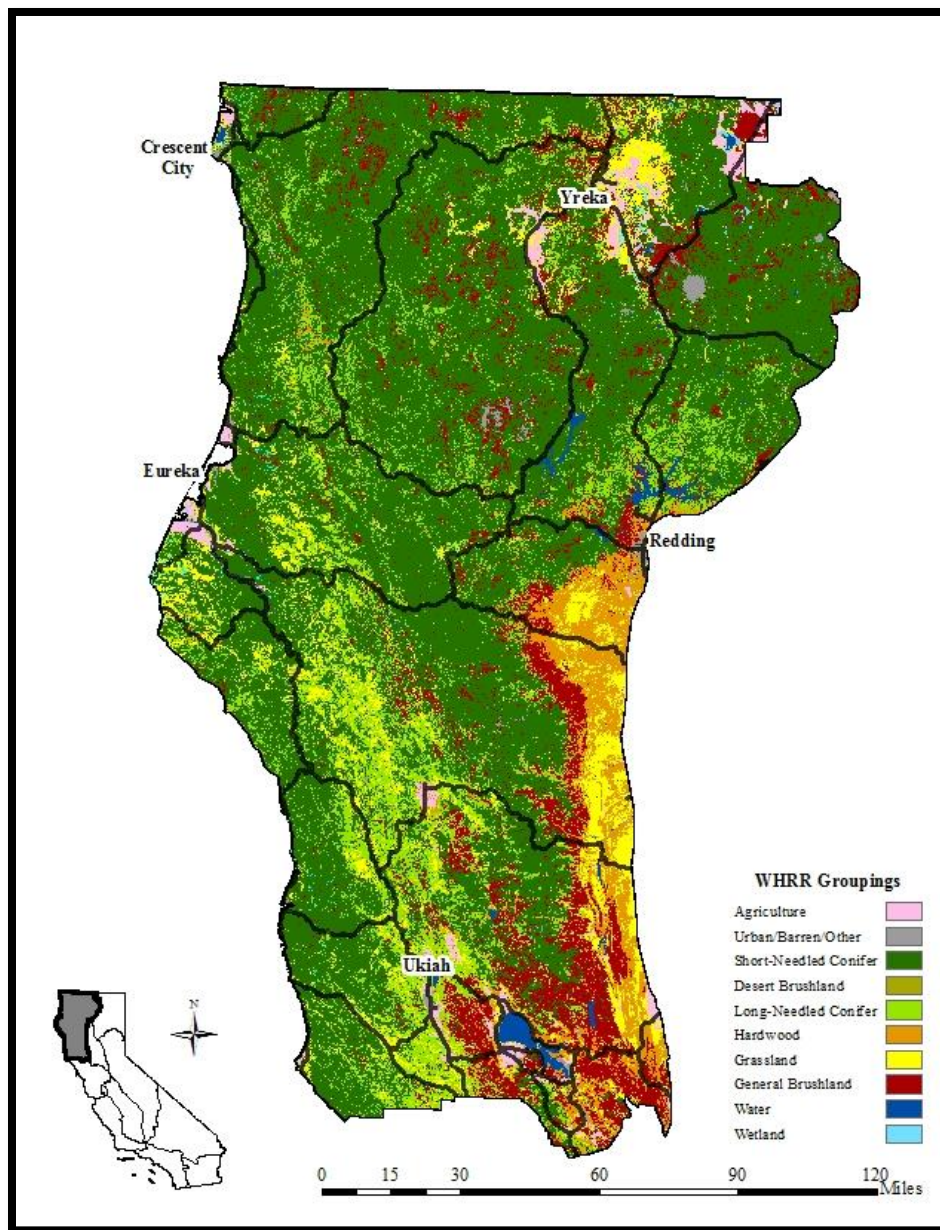


Figure A.2-1 Klamath/ North Coast Bioregion

### A.2.2 MODOC BIOREGION

**Description:** Bounded on north by the Oregon border and on the east by the Nevada border. The bioregion extends west to include all of Modoc National Forest and Lassen National Forest, plus additional lands extending down to the Sacramento Valley floor. The southern boundary reaches the southern limits of Lassen National Forest and Lassen County.

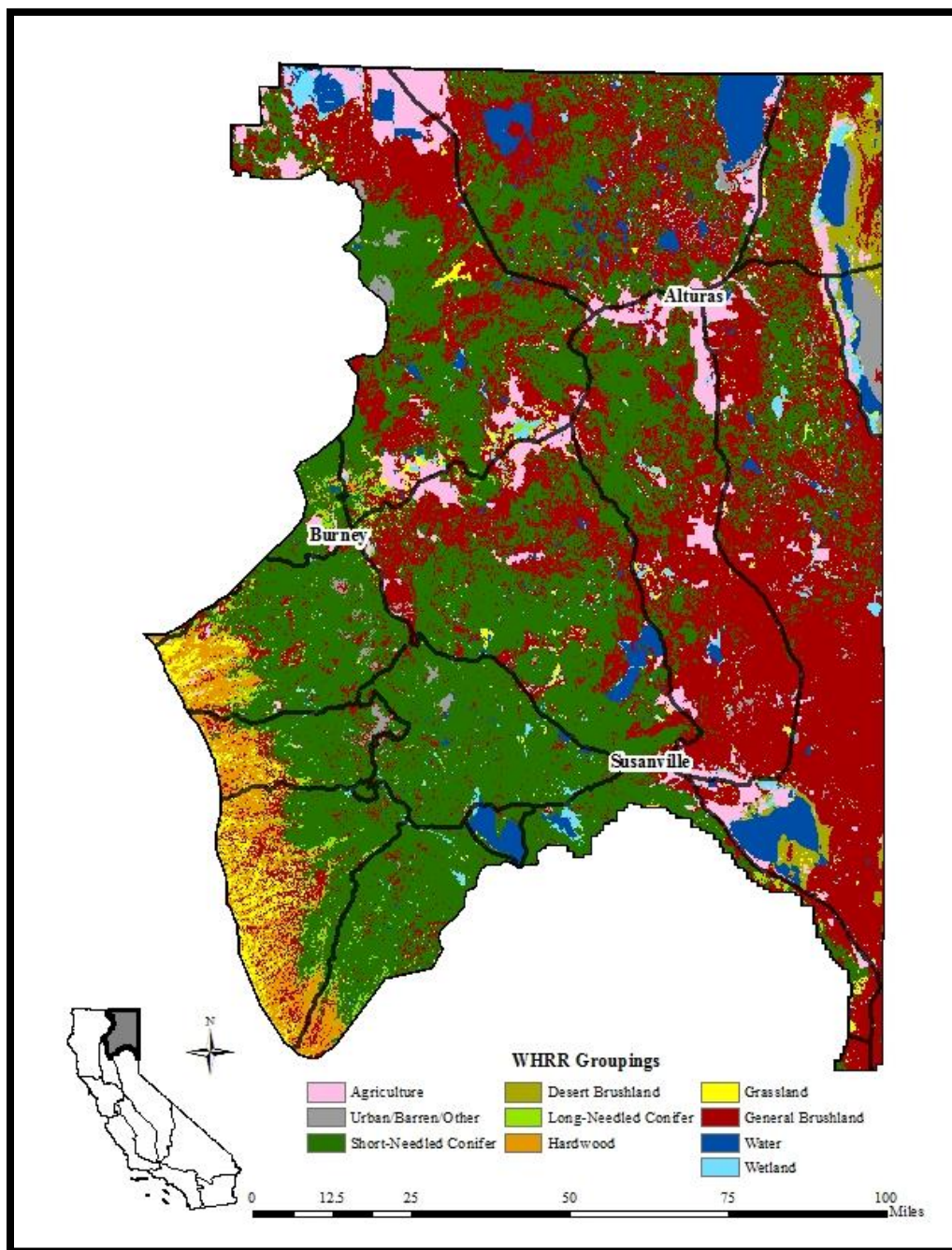


Figure A.2-2 Modoc Bioregion

### A.2.3 SACRAMENTO VALLEY BIOREGION

**Description:** The western, northern and eastern limits are the edges of the valley floor (essentially where the blue oak woodland starts). The southern limit is the northern edge of the Sacramento-San Joaquin Delta.

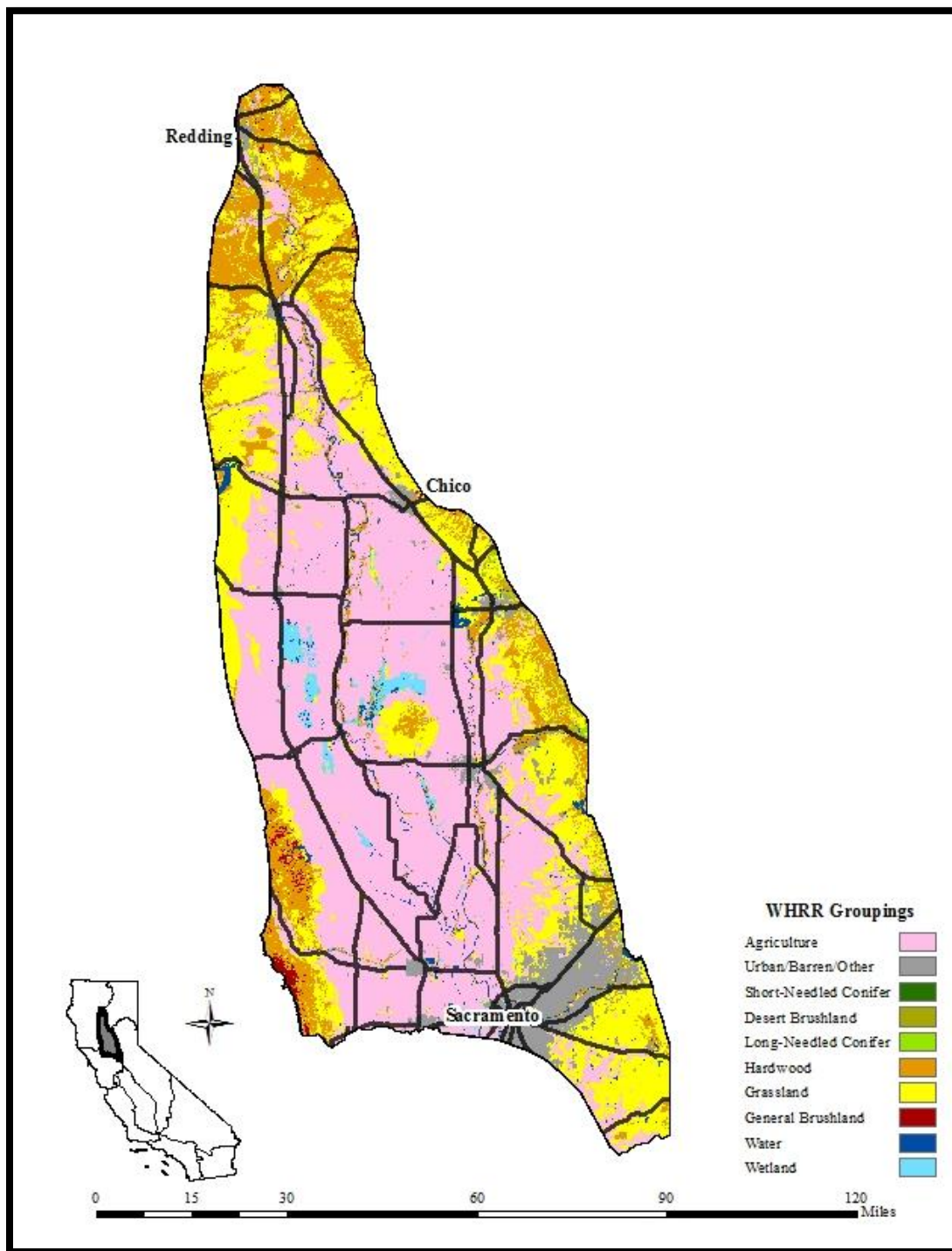


Figure A.2-3 Sacramento Valley Bioregion



#### A.2.4 BAY AREA/ DELTA BIOREGION

**Description:** The boundary is essentially the immediate watershed of the Bay Area and the Delta, not including the major rivers that flow into the Delta. Bounded on the north by northern edge of Sonoma and Napa counties and the Delta and extending east to the edge of the Sacramento valley floor. The bioregion is bounded on the south by the southern edge of San Joaquin County, the eastern edge of the Diablo Range, the southern edge of Santa Clara and San Mateo counties.

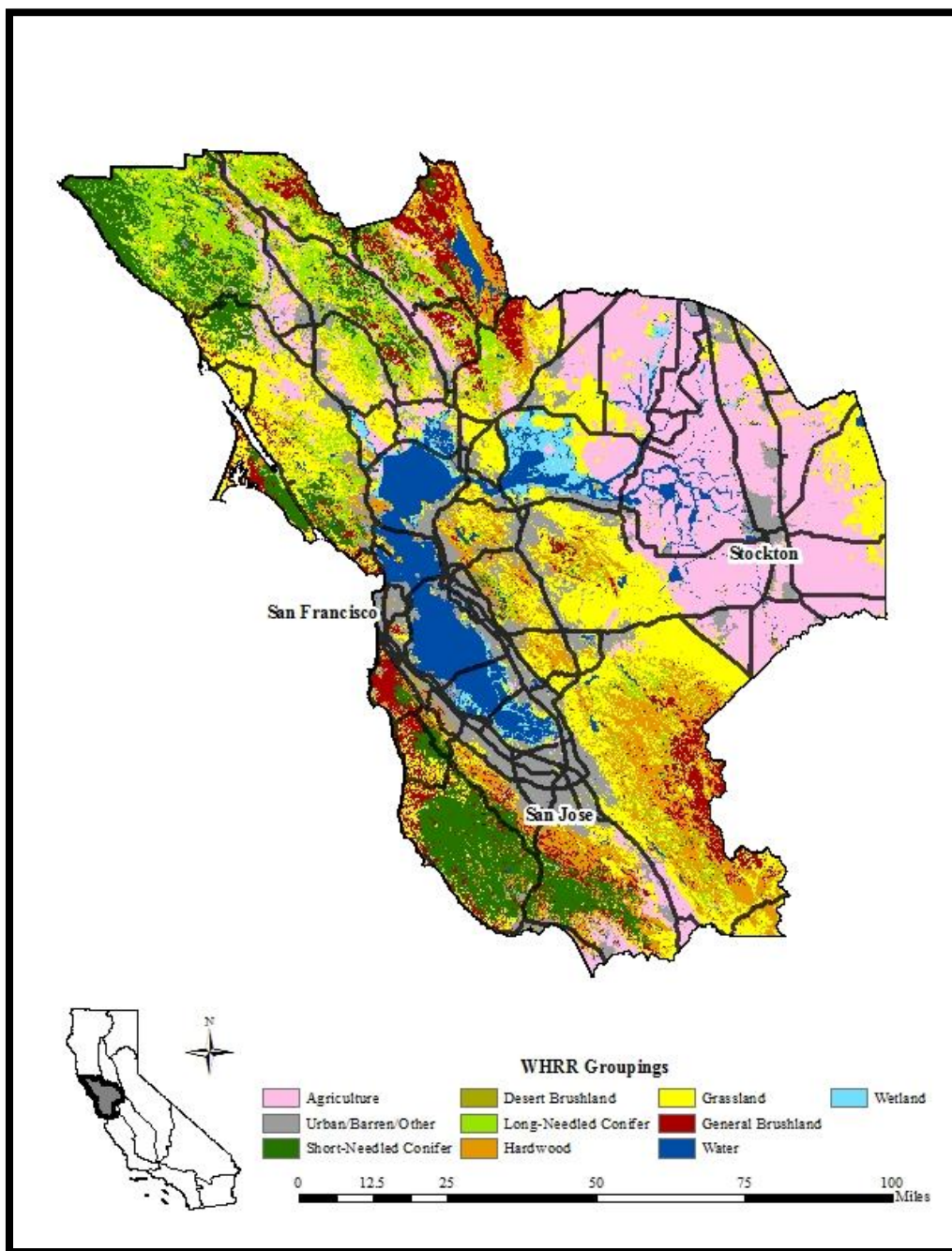


Figure A.2-4 Bay Area/ Delta Bioregion

### A.2.5 SIERRA BIOREGION

**Description:** Bounded on the north by the northern edge of Plumas National Forest. The western edge is the Sacramento Valley floor. Bounded on the east by the Nevada state line and the western edge of BLM's California Desert Conservation Area and bounded on the west by the Sacramento and San Joaquin Valley floors, and south to the Tejon Pass in the Tehachapi Mountains.

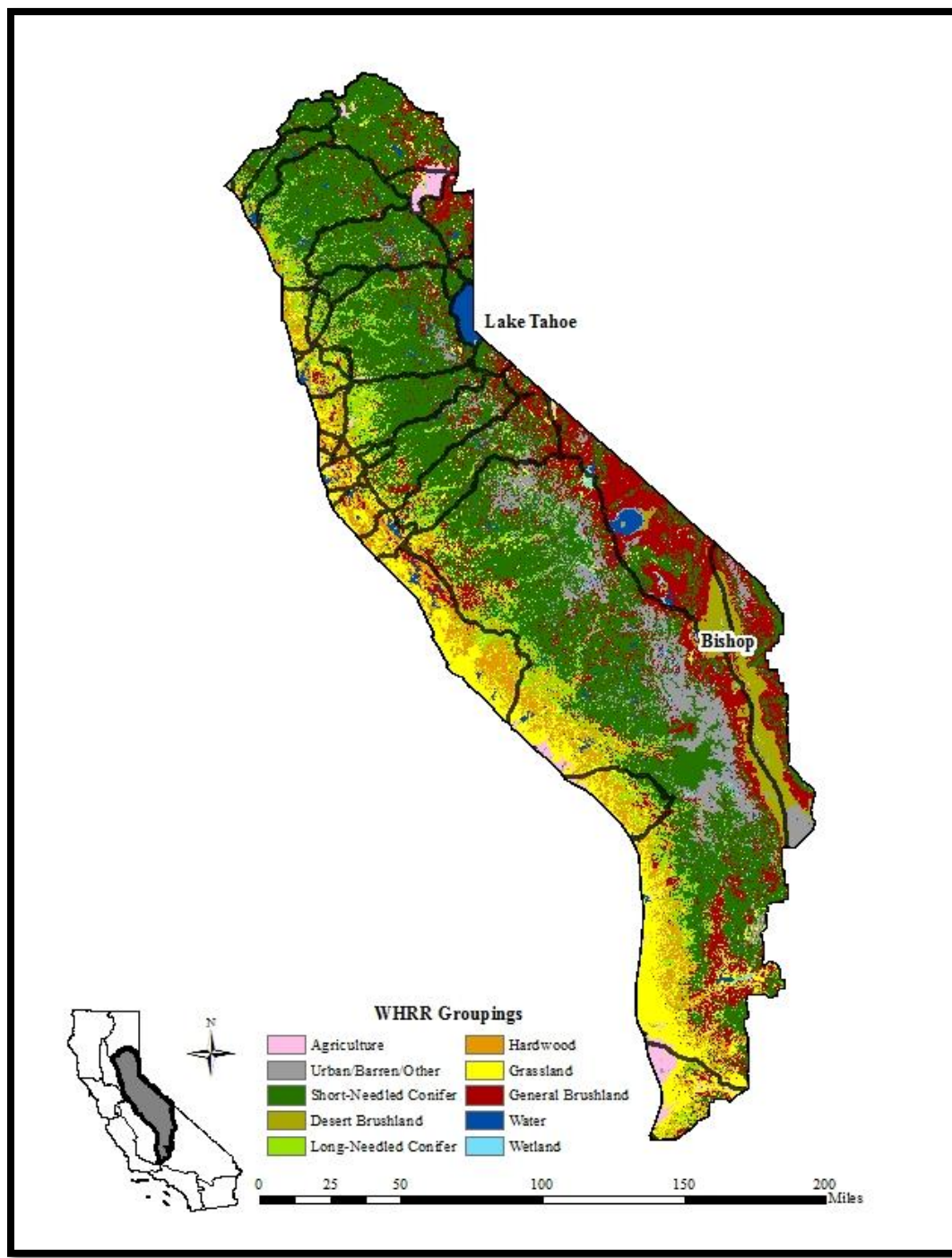


Figure A.2-5 Sierra Bioregion

### A.2.6 SAN JOAQUIN BIOREGION

**Description:** Bounded on north by the southern edge of the Delta, and on all other sides (west, south, east) by the San Joaquin Valley floor. The one major exception to this is the southwestern extension to include the Carrizo Plain and BLM-managed lands in the Caliente Resource Area (eastern San Luis Obispo County).

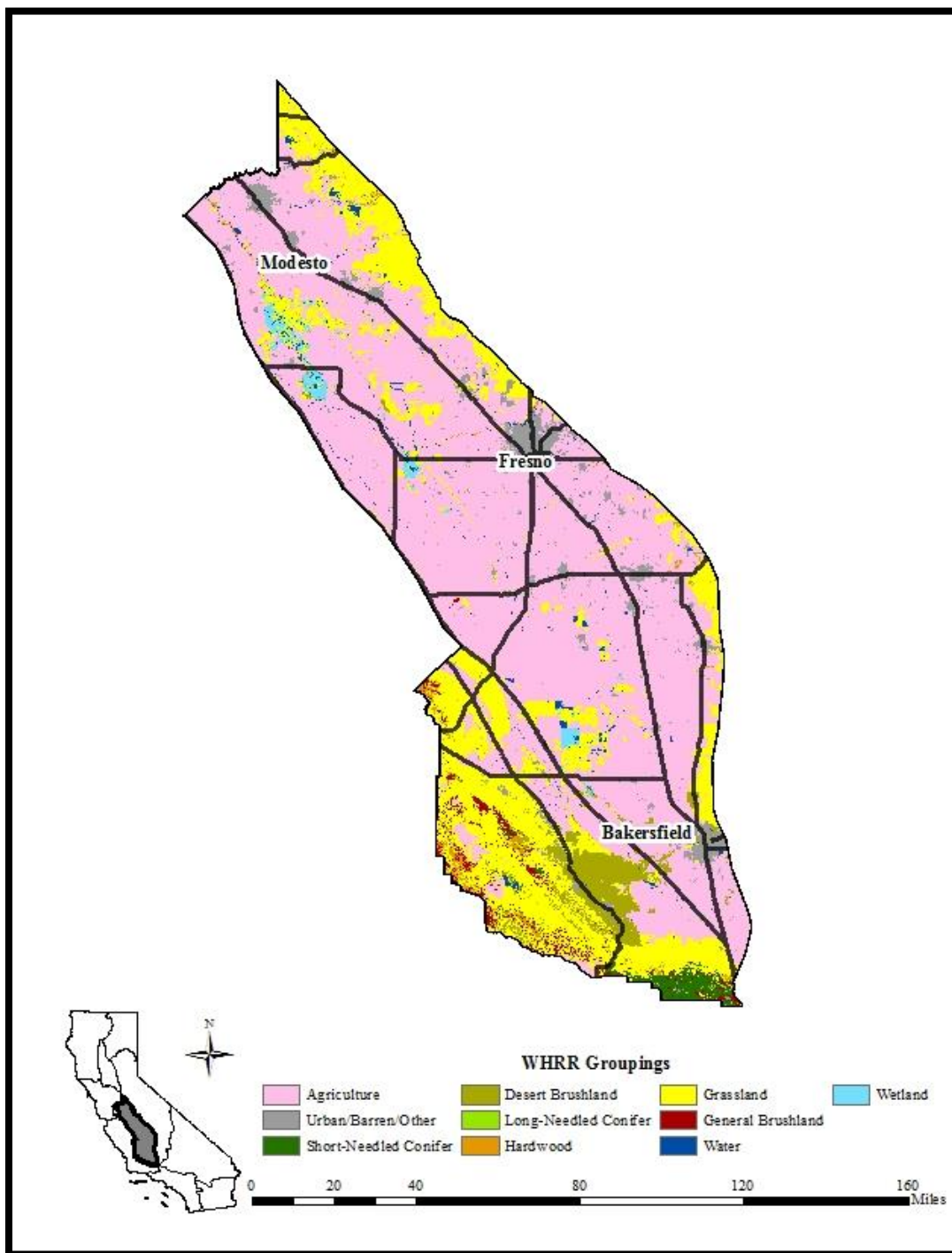


Figure A.2-6 San Joaquin Bioregion

### A.2.7 CENTRAL COAST BIOREGION

**Description:** Bounded on north by the northern limits of Santa Cruz and San Benito counties, and on the east by the San Joaquin Valley floor and the Carrizo Plain. The southeastern limit is the eastern and southern edges of the Los Padres National Forest. The western edge is the coastline.

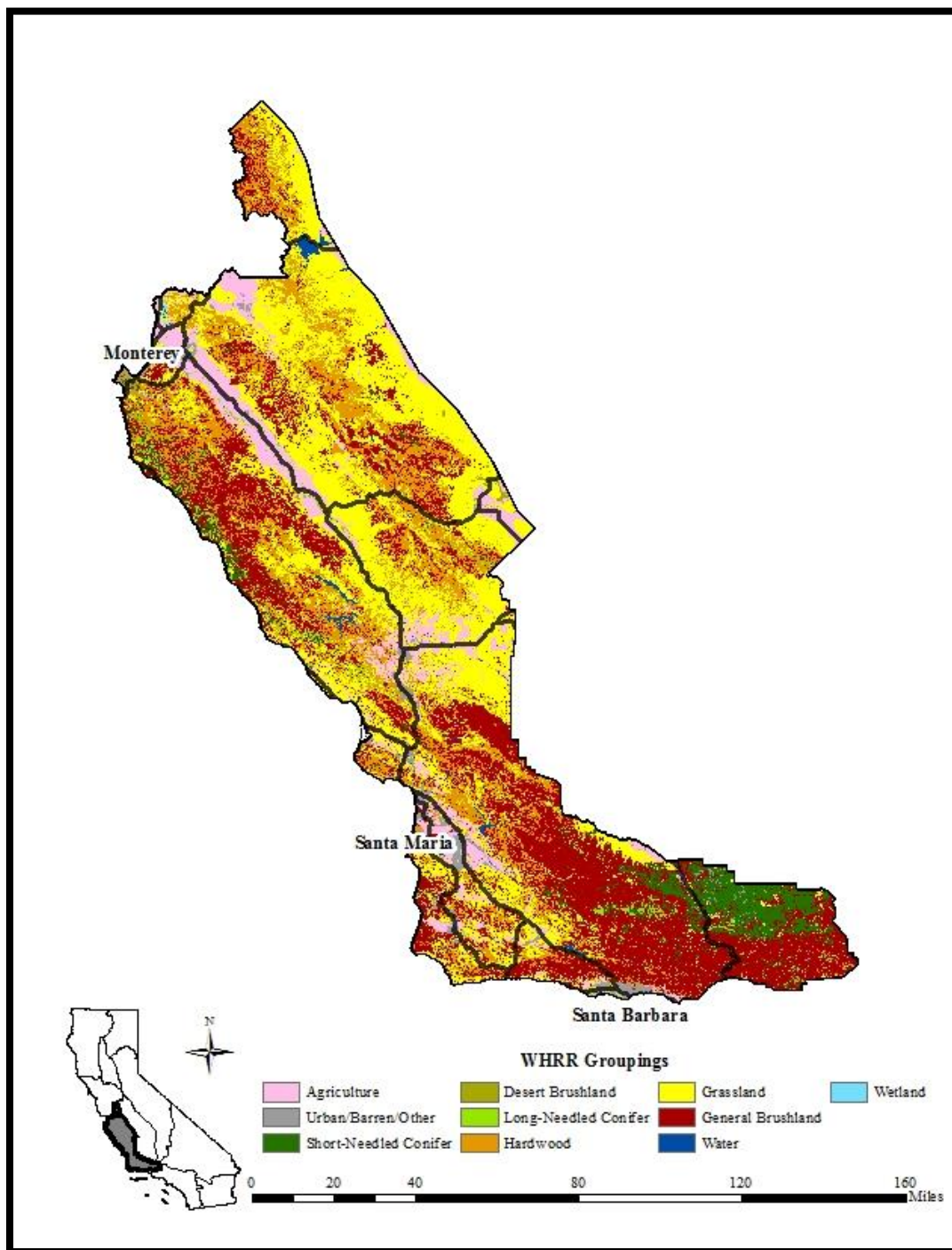


Figure A.2-7 Central Coast Bioregion



### A.2.8 MOJAVE BIOREGION

**Description:** Bounded on west by western edge of BLM California Desert Conservation Area and on east by Nevada state line. Bounded on south by the northern base of the San Gabriel and San Bernardino Mountains, the southern edge of Joshua Tree National Monument, and the southern edge of San Bernardino County (between Joshua Tree and Nevada state line).

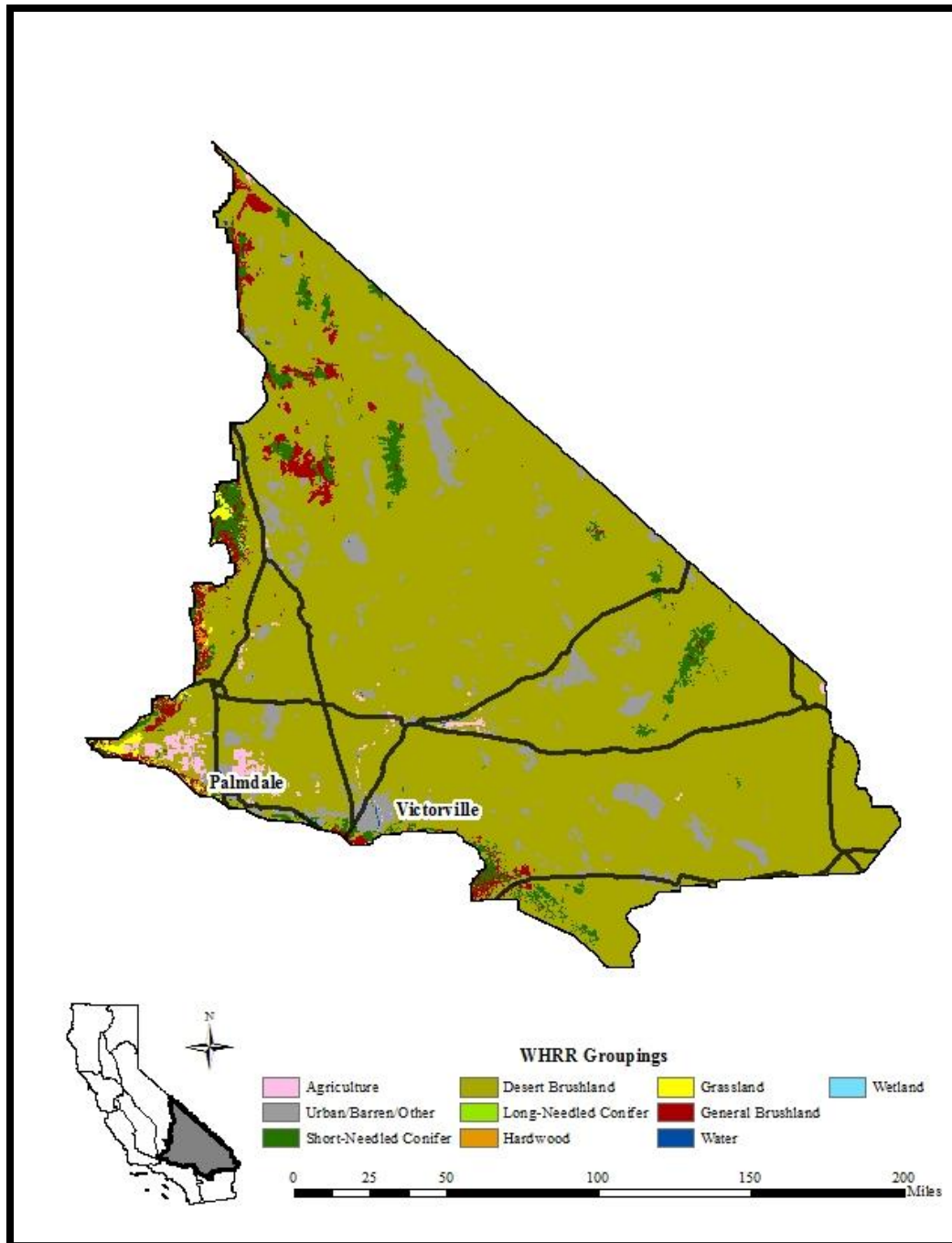


Figure A.2-8 Mojave Bioregion

### A.2.9 SOUTH COAST BIOREGION

**Description:** Bounded on the north by the southern edge of Los Padres National Forest and the northern base of the San Gabriel and San Bernardino Mountains and bounded on the east by the western edge of the BLM California Desert Conservation Area and on south by Mexican border.

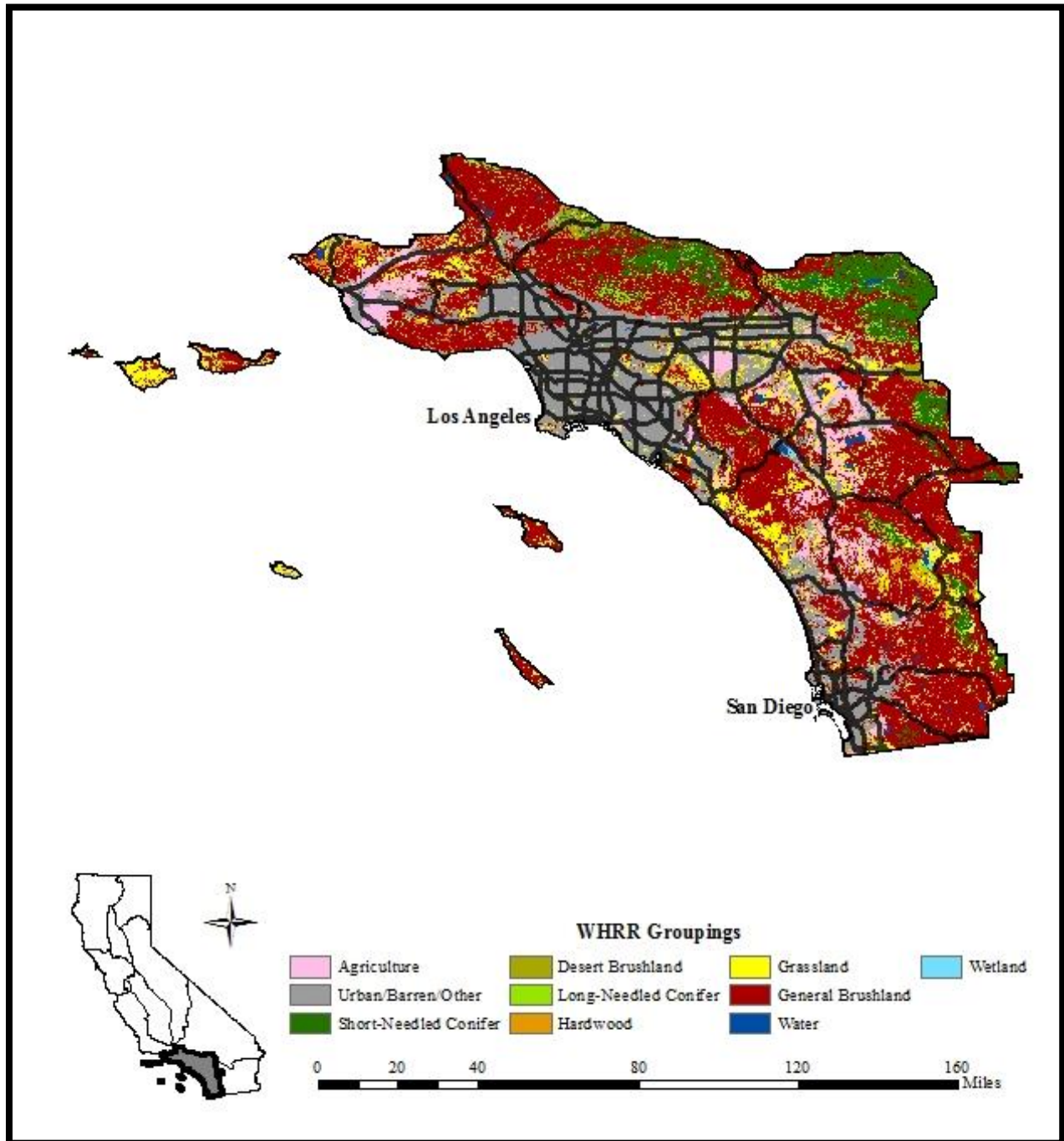


Figure A.2-9 South Coast Bioregion

### A.2.10 COLORADO DESERT BIOREGION

**Description:** Bounded on the west by the western edge of the BLM Desert Conservation Area and on the north by the southern edge of Joshua Tree National Monument and the southern edge of San Bernardino County and the east by Arizona state line and on south by Mexican border.

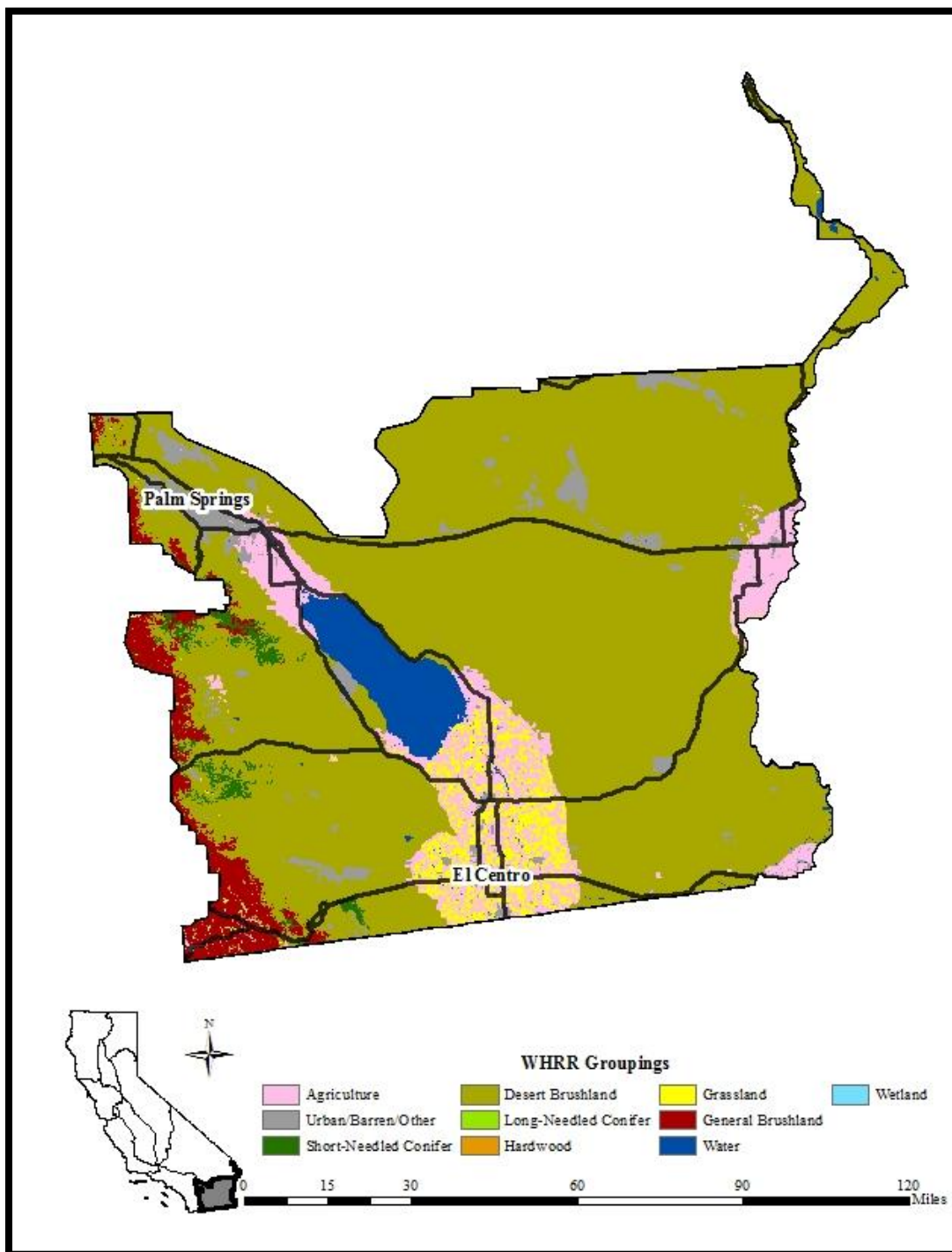


Figure A.2-10 Colorado Desert Bioregion